

CLAIMS:

1. A demand assignment method for a synchronous communication network including a hub and a plurality of user nodes each at a different distance from the hub that communicate with the hub via a satellite, said method comprising steps of:

5 transmitting a first frame from the hub to each user node, the first frame including a first burst time plan according to a demand data structure and predetermined rules;

 transmitting a first respective data burst in a first frame time period from each of the user nodes to the hub according to the first burst time plan, a start of the first
10 frame time period from each of the user nodes being received at the hub simultaneously, each first data burst including a demand field;

 storing each demand field in the demand data structure;

 transmitting a second frame from the hub to each user node immediately following the first frame, the second frame including a second burst time plan
15 according to the demand data structure and the predetermined rules;

 transmitting a second respective data burst in a second frame time period from each of the user nodes to the hub according to the second burst time plan, a start of the second frame time period from each of the user nodes being received at the hub simultaneously,

20 wherein the second respective data burst in the second frame time period is received at the hub immediately following the first respective data burst in the first frame time period.

 2. The method of claim 1, wherein the predetermined rules include at least
25 one of configuration parameters, rate shaping rules, and prioritization rules.

3. The method of claim 2, wherein the configuration parameters include at least one of a number of slots per frame, a number of upstream channels per user, and a frame rate.

5 4. The method of claim 2, wherein the rate shaping rules include at least one of a minimum data rate, a real time data rate, and a committed information rate.

5. The method of claim 2, wherein the prioritization rules include at least one predetermined sequence of servicing minimum data rate demand, servicing real time
10 data rate demand, and servicing committed information rate demand.

6. A system that provides demand assignment to a plurality of nodes in a synchronous communication network, said plurality of user nodes each at a different distance from a hub and communicates with the hub via a satellite, said system
15 comprising:

the hub which is configured to form and transmit a first frame from the hub to each user node, the first frame including a first burst time plan according to a demand data structure and predetermined rules;

the plurality of user nodes each configured to form and transmit a first data
20 burst in a first frame time period to the hub according to the first burst time plan, a start of the first frame time period from each of the user nodes being received at the hub simultaneously, each first data burst including a demand field, wherein

said hub is configured to store each demand field in the demand data structure and transmit a second frame to each user node immediately following the first frame,

the second frame including a second burst time plan according to the demand data structure and the predetermined rules,

each of said plurality of user nodes being configured to form and transmit a second respective data burst in a second frame time period to the hub according to the second burst time plan, a start of the second frame time period from each of the user nodes being received at the hub simultaneously,

the second respective data burst in the second frame time period is received at the hub immediately following the first respective data burst in the first frame time period.

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7. The system of claim 6, wherein the predetermined rules include at least one of configuration parameters, rate shaping rules, and prioritization rules.

8. The system of claim 7, wherein the configuration parameters include at least one of a number of slots per frame, a number of upstream channels per user, and a frame rate.

9. The system of claim 7, wherein the rate shaping rules include at least one of a minimum data rate, a real time data rate, and a committed information rate.

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10. The system of claim 7, wherein the prioritization rules include at least one predetermined sequence of servicing minimum data rate demand, servicing real time data rate demand, and servicing committed information rate demand.

11. A hub that coordinates demand assignment for a plurality of nodes in a synchronous communication network, said plurality of user nodes each at a different distance from a hub and communicates with the hub via a satellite, said hub comprising:

5 means for forming and transmitting a first frame to each user node, the first frame including a first burst time plan according to a demand data structure and predetermined rules;

 means for receiving from the plurality of user nodes a first data burst in a first frame time period transmitted to the hub according to the first burst time plan, a start
10 of the first frame time period from each of the user nodes being received at the hub simultaneously, each first data burst including a demand field;

 means for storing each demand field in the demand data structure and transmitting a second frame to each user node immediately following the first frame, the second frame including a second burst time plan according to the demand data
15 structure and the predetermined rules; and

 means for receiving from each of said plurality of user nodes a second respective data burst in a second frame time period according to the second burst time plan, a start of the second frame time period from each of the user nodes being received at the hub simultaneously, wherein

20 the second respective data burst in the second frame time period is received at the hub immediately following the first respective data burst in the first frame time period.

12. A user node in a synchronous communication network, which is part of a plurality of nodes, said plurality of user nodes each at a different distance from a hub and communicates with the hub via a satellite, said user node comprising:

means for receiving from the hub a first frame, the first frame including a first burst time plan according to a demand data structure and predetermined rules;

means for forming and transmitting a first data burst in a first frame time period to the hub according to the first burst time plan, a start of the first frame time period from each of the user nodes being received at the hub simultaneously, each first data burst including a demand field, wherein

said hub is configured to store each demand field in the demand data structure and transmit a second frame to each user node immediately following the first frame, the second frame including a second burst time plan according to the demand data structure and the predetermined rules,

said user hub further comprising means for forming and transmitting a second respective data burst in a second frame time period to the hub according to the second burst time plan, a start of the second frame time period from each of the user nodes being received at the hub simultaneously,

the second respective data burst in the second frame time period is received at the hub immediately following the first respective data burst in the first frame time period.